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# 2015 QUARTERLY INSPECTIONS AND ANNUAL STORMWATER SAMPLING COSTCO WHOLESALE WAREHOUSE #764 5300 SOUTH STATE STREET, MURRAY UTAH KLEINFELDER PROJECT NO.: 00135150.000A

**DECEMBER 15, 2015**

A Report Prepared for:

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**2015 QUARTERLY INSPECTIONS AND ANNUAL STORMWATER SAMPLING COSTCO WHOLESALE WAREHOUSE #764 5300 SOUTH STATE STREET, MURRAY UTAH**

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**Standard Mine RA Phase 1 Project Contact List Effective: 1 January 2016**

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# 1 EXECUTIVE SUMMARY

This report summarizes Kleinfelder's 2015 quarterly stormwater drain inspections, and annual stormwater sampling conducted at the Costco Warehouse #764, located at 5300 South State Street, in Murray, Utah (Site). The inspections and sampling were conducted to assess the concentrations of dissolved arsenic conveyed through the Site storm drains, and the effectiveness of previous storm drain repairs. As requested by the Environmental Protection Agency (EPA) and Utah Department of Environmental Quality (UDEQ) the system was inspected quarterly during 2015 to assess for groundwater leakage into the storm drains. Additionally, in October 2015 annual stormwater sampling and laboratory analysis was conducted.

The Site stormwater drains were visually inspected in January, April, August and October 2015. No obvious leakage or groundwater infiltration was observed in any of the storm drain drop inlets (SDDI) or storm drain manholes (SDMH) during the four 2015 inspection events. In October 2015 eight stormwater samples were collected from Site SDDIs and SDMHs and analyzed for total concentrations of dissolved arsenic. The dissolved arsenic concentrations were reported at 0.0935 milligrams per liter (mg/L) or less. The arsenic concentrations detected in the stormwater samples have decreased by at least two orders of magnitude in the impacted SDDIs and SDMHs since the storm drain system was repaired in October 2013. The detected arsenic concentrations from all locations sampled during the October 2015 sampling event were well below the hazardous waste toxicity criteria for arsenic of 5 mg/L.

Results of the 2015 quarterly monitoring and sampling events indicate that the repair work conducted on the leaking storm drain drop inlet vaults in 2013 has been effective in mitigating the arsenic-impacted groundwater infiltrating into the stormwater drainage system. This reduction has been maintained for all of 2014 and 2015. The October 2015 sampling event completes two years of quarterly monitoring since the storm water drainage system repairs were performed. Costco believes we have met our regulatory commitment regarding the Site and request release from further actions.

# 2 INTRODUCTION AND SITE DESCRIPTION

## 2.1. INTRODUCTION

Kleinfelder has prepared this 2015 Annual Stormwater Monitoring Report at the request of Costco Wholesale Corporation (Costco) for the Costco Warehouse #764 located at 5300 South State Street, Murray, Utah. This report presents the results of four quarterly stormwater inspection events and the October 2015 stormwater quality sampling event, which were conducted to assess the concentrations of dissolved arsenic conveyed through the Site stormwater drainage system and the effectiveness of previous storm drain repairs. This work was conducted in accordance with our proposed Contract Amendment #6, dated May 11, 2015, and the EPA and UDEQ approved Stormwater System Repairs and Stormwater Monitoring Work Plan, dated September 25, 2013 (Kleinfelder Document SLC13L0562).

## 2.2. SITE DESCRIPTION

The Costco Warehouse #764 is located on the northwest corner of 5300 South and State Street in Murray, Utah. The Site encompasses approximately 16.4 acres and comprises assessor parcel numbers 2, 3, 5, 6, 7, 8, 9 and parts of parcels 1 and 4. The ground surface elevation of the Site ranges from 4,290 to 4,315 feet above mean sea level. The topography of the Site slopes gently to the northeast. Precipitation and landscape irrigation runoff from the Site is directed into the Site's stormwater drainage system. Costco's stormwater system drains into the adjacent Intermountain Health Care (IHC) stormwater system which in turn drains into Little Cottonwood Creek, located north of the Site. A map of the stormwater system is attached (Figure 1), which indicates the locations of the storm drain drop inlets, storm drain manholes, drain piping, and repair locations.

# 3 BACKGROUND

## 3.1. BACKGROUND

The Site lies on a portion of the historical Murray Smelter Superfund Site. Elevated concentrations of arsenic in soil and groundwater are documented beneath the Costco Site from historical smelter activities. Elevated concentrations of arsenic were identified in the Site stormwater during a manhole repair in 2013. Arsenic in the stormwater samples suggested that contaminated groundwater was infiltrating into the stormwater system. During the construction of the Costco warehouse in 2002, it was recognized that SDDI 5 and 6 were constructed below the groundwater table. The SDDIs are constructed as concrete vaults approximately 11 feet deep, 3 feet long and 4 feet wide.

Based on visual inspections of the storm drains in 2013, it was evident that two storm drain drop-inlets (SDDI #5 and SDDI #6) were cracked and allowing groundwater into the storm system via the storm drain sidewalls. Site repairs were conducted on October 2, 3 and 20, 2013 by David W Majors & Sons, Inc. a subcontractor to Parsons Excavating Inc. and Robinson Construction. Kleinfelder personnel were on Site to observe and document the repairs. The repairs consisted of surface grouting cracks in storm drain vaults SDDI #8 and #11, replacing the diverter/snorkel in manhole SDMH #5, and sealing the groundwater infiltration leaks in storm drains SDDI #4, #5 and #6. The repairs were conducted in accordance with the EPA, UDEQ and Murray City approved Stormwater System Repairs and Stormwater Monitoring Work Plan dated September 25, 2013.

Costco completed five storm water sampling and storm drain inspection events through October 2014. Ms. Erna Waterman of the EPA then requested that Costco continue to visually inspect the storm drain system for three more quarters and, during the fourth quarter of 2015, collect stormwater samples during the inspection event. Based on the results of the inspections and sampling, it would be determined whether the Site storm drain monitoring could be terminated.

## 4 STORM DRAIN QUARTERLY INSPECTIONS

The Site stormwater drains were visually inspected in January, April, August and October 2015. No obvious leakage or groundwater infiltration was observed in any of the SDDIs during the four inspection events. The SDDIs were inspected to assess whether groundwater was leaking into the storm drain system via the drain vaults. Based upon previous site investigations and storm drain repairs, inspections of SDDI- 1, 2, 3, 4, 5, 6, 7, 8 and 9 were included in the inspection. No obvious leaks or water infiltration was observed in any of the SDDIs during the four inspection events. Information collected during the inspections were recorded on the Storm Drain Inspection Checklists included in Appendix A. The storm drain system layout is presented in Figure 1. The sample locations and analytical results of the last three sampling events are presented in Figure 2.

# 5 STORMWATER SAMPLING

Stormwater samples were collected from six SDDIs and two SDMHs in October 2015. Previous stormwater sampling events were conducted in October 2013, January 2014, April 2014, and July 2014. The following describes the methods and results of the annual sampling event conducted on October 21, 2015.

## 5.1. SAMPLE LOCATIONS

Eight stormwater samples were collected from the Site storm drain drop inlets and manholes, including SDDI 3, 4, 5, 6, 7, and 9 and SDMH 4 and 5. Seven of the sample points are located at or downgradient of SDDI 4, 5 and 6, where the storm drain groundwater infiltration leaks were observed. In addition, one upgradient stormwater sample was collected as a control sample from SDDI 3, where elevated arsenic has not been identified. The storm drain locations are presented on Figure 2, Stormwater Sampling Results.

## 5.2. SAMPLING METHODS AND ANALYSES

Kleinfelder personnel collected stormwater samples from the locations listed above. The stormwater samples were collected as "grab" samples, using dedicated, disposable sample cups. A new pair of disposable nitrile gloves was worn to collect each sample to reduce the potential for cross-contamination. The samples were placed in laboratory-prepared, 500-milliliter plastic containers. Because the samples were analyzed for dissolved arsenic, the samples were not preserved with nitric acid in the field, and were filtered upon delivery to the laboratory. The samples were delivered to the laboratory under chain-of-custody documentation. The samples were analyzed for dissolved arsenic using method E200.8.

## 5.3. ANALYTICAL RESULTS AND DISCUSSION

The October 2015 sampling results reported dissolved arsenic concentrations in the eight stormwater samples ranging from 0.0153 mg/L to 0.0935 mg/L. These concentrations are well below the hazardous waste toxicity criteria for arsenic of 5 mg/L. This is the fifth consecutive sampling event where arsenic concentrations in all stormwater samples were below 5 mg/L.

The detected arsenic concentrations have decreased approximately two orders of magnitude in the impacted SDDIs and SDMHs since the original June 2013 sampling event. The upgradient/control stormwater sample collected from SDDI 3 remained low in arsenic with a concentration of 0.0153 mg/L. Table 1 presents the current and previous stormwater analytical results. Figure 2 presents the stormwater sampling results along with the locations of the storm drain drop inlets and manholes. The analytical laboratory report for the October 2015 stormwater sampling event is included in Appendix A.

Table 1

Murray Costco Stormwater Sampling Results

June 25, 2013 – October 21, 2015

| Sample Location | SDDI 3 | SDDI 4 | SDDI 5 | SDDI 6 | SDDI 7 | SSDI 9 | SDMH 4 | SDMH 5 |
|---|---|---|---|---|---|---|---|---|
| | Dissolved Arsenic (mg/L) | | | | | | | |
| 6/25/2013[1] | .008 | NA | **15** | 14 | 14 | 9.1 | 11 | 11 |
| 6/25/2013[2] | .0075 | NA | 16 | 14 | 14 | 9.2 | 11 | 11 |
| 10/24/2013[3] | <0.002 | 3.94 | 2.20 | 3.42 | 1.71 | 5.29 | 5.77 | 7.95 |
| 1/15/2014[4] | 0.0116 | 4.45 | 0.795 | 0.993 | 0.528 | 0.292 | 0.202 | 0.133 |
| 4/17/2014[5] | 0.004 | 2.02 | 0.900 | 0.789 | 0.475 | 0.258 | 0.261 | 0.200 |
| 7/30/14[5] | 0.0058 | 0.110 | 0.059 | 0.019 | 0.020 | 0.077 | 0.059 | 0.047 |
| 10/24/14[5] | 0.0172 | 2.92 | 2.18 | 0.949 | 1.34 | 0.208 | 0.259 | 0.125 |
| 10/21/15[5] | 0.0153 | 0.0174 | 0.0266 | 0.0207 | 0.0277 | 0.0693 | 0.0935 | 0.0604 |

Notes:

**BOLD** values indicate arsenic concentrations above the hazardous waste toxicity criteria of 5 mg/L.

1. Samples analyzed for <u>total</u> arsenic. Samples dated 6/25/13 were collected by Environ under direction of the EPA. Samples from all other dates were collected by Kleinfelder.
2. The samples collected by Environ were analyzed for <u>dissolved</u> arsenic.
3. Samples dated 10/24/13 were analyzed for total arsenic and pH. pH results ranged from 7.55 to 7.95.
4. Samples dated 1/15/14 were analyzed for dissolved arsenic and pH. pH results ranged from 7.55 to 7.81.
5. Samples dated 4/17/14 and later were analyzed for dissolved arsenic.
6. Samples collected by Kleinfelder were analyzed by American West Analytical Laboratory or ALS Laboratory using EPA method SW6020A or E200.8.